

WHAT IS CLAIMED IS:

1. A nonreciprocal circuit device comprising:

a permanent magnet;

a ferrite element to which a DC magnetic flux is applied by said permanent

5 magnet;

a plurality of center electrodes provided on said ferrite element; and

a metal casing which is made of an iron-based metal and which
accommodates said permanent magnet, said ferrite element, and said center
electrodes,

10 wherein said metal casing comprises a first casing member and a second
casing member, the first casing member and said permanent magnet are in magnetic
contact with each other, and the second casing member has a thickness between 50%
and 100% of a thickness of the first casing member.

2. A nonreciprocal circuit device according to claim 1, wherein the second
15 casing member comprises a pair of second casing sidewalls that oppose each other.

3. A nonreciprocal circuit device according to claim 1, wherein the second
casing member comprises a first pair of second casing sidewalls that oppose each
other, and a second pair of second casing sidewalls that oppose each other.

4. A nonreciprocal circuit device according to claim 1, wherein the first casing member comprises a pair of first casing sidewalls that oppose each other, and the second casing member comprises a pair of second casing sidewalls that oppose each other, the first casing sidewalls and the second casing sidewalls being overlapped and joined to each other.

5. A nonreciprocal circuit device according to claim 4, further comprising a resin casing member which is incorporated in said metal casing and which accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet.

6. A nonreciprocal circuit device comprising:
a permanent magnet;
a ferrite element to which a DC magnetic flux is applied by said permanent magnet;
a plurality of center electrodes provided on said ferrite element; and
a metal casing which is made of an iron-based metal and which accommodates said permanent magnet, said ferrite element, and said center electrodes,

wherein said metal casing comprises a first casing member and a second casing member, the first casing member and said permanent magnet are in magnetic contact with each other, and the second casing member has a thickness between 50% and 100% of a thickness of the first casing member;

5 wherein the first casing member comprises a pair of first casing sidewalls that oppose each other, and the second casing member comprises a pair of second casing sidewalls that oppose each other, the first casing sidewalls and the second casing sidewalls being overlapped and joined to each other;

 wherein a resin casing member is incorporated in said metal casing and
10 accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet; and

 wherein said contact-preventing portions have a thickness greater than that of
15 the upper casing member, and have upper surfaces which are extended to a location higher than a bottom surface of the magnet.

7. A nonreciprocal circuit device according to claim 5, wherein said resin casing member is insert-molded in said second casing member so as to integrally join the same.

20 8. A nonreciprocal circuit device according to claim 4, wherein said second

casing sidewalls overlap respective outer surfaces of the first casing sidewalls.

9. A nonreciprocal circuit device according to claim 4, wherein said second casing sidewalls overlap respective inner surfaces of the first casing sidewalls.

10. A nonreciprocal circuit device according to claim 9, further comprising a
5 resin casing member which is incorporated in said metal casing and which accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet.

10 11. A nonreciprocal circuit device comprising:
a permanent magnet;
a ferrite element to which a DC magnetic flux is applied by said permanent magnet;
a plurality of center electrodes provided on said ferrite element; and
15 a metal casing which is made of an iron-based metal and which accommodates said permanent magnet, said ferrite element, and said center electrodes,

wherein said metal casing comprises a first casing member and a second

casing member, the first casing member and said permanent magnet are in magnetic contact with each other, and the second casing member has a thickness between 50% and 100% of a thickness of the first casing member;

5 wherein the first casing member comprises a pair of first casing sidewalls that oppose each other, and the second casing member comprises a pair of second casing sidewalls that oppose each other, the first casing sidewalls and the second casing sidewalls being overlapped and joined to each other;

wherein said second casing sidewalls overlap respective inner surfaces of the first casing sidewalls;

10 wherein a resin casing member is incorporated in said metal casing and accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet;

15 wherein said contact-preventing portions have a thickness greater than that of the upper casing member, and have upper surfaces which are extended to a location higher than a bottom surface of the magnet.

20 12. A nonreciprocal circuit device according to claim 10, wherein said resin casing member is insert-molded in said second casing member so as to integrally join the same.

13. A nonreciprocal circuit device according to claim 1, wherein the first

casing member and the second casing member are joined by welds.

14. A nonreciprocal circuit device according to claim 1, wherein at least one of the first casing member and the second casing member has plated surfaces comprising one of nickel and copper, and said plated surfaces are further plated with silver.

15. A nonreciprocal circuit device according to claim 14, wherein said plated surfaces consist essentially of nickel plated with silver.

16. A nonreciprocal circuit device according to claim 1, wherein said DC magnetic flux is unsaturated in said second casing member.

17. A nonreciprocal circuit device according to claim 1, wherein said metal casing comprises SPCC.

18. A nonreciprocal circuit device according to claim 5, wherein said contact-preventing portions have upper surfaces which are extended to a location higher than a bottom surface of the magnet.

19. A nonreciprocal circuit device according to claim 18, wherein said contact-preventing portions cover substantially all of an inner surface of each first

casing sidewall.

20. A communication apparatus comprising at least one of a transmission circuit and a reception circuit, said circuit comprising the nonreciprocal circuit device according to claim 1.

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